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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,165	11/29/2000	Jose Geraldo Furtado Ramos	2764-34	8558

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EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 06/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/725,165

Applicant(s)

RAMOS ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on April 13, 2004 has been received and carefully considered. The changes made to the Drawings are acceptable. Claim 2 has been cancelled. Claims 1 and 3-6 remain active.

Claim Objections

2. Claim 5 is objected to because it is unclear as to the structural limitation applicant is attempting to recite due to improper grammatical form. (i.e., "... the total angle subtended by the succession of straight tube sections at the center of curvature of the radius-curve ??? a descending mass flow of dense phase solids ..." in lines 3-4). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kaulakis (US 2,815,268).

Kaulakis (see FIG. 1) discloses an apparatus comprising a cyclone separator leg which joins the lower end of the leg of a secondary cyclone and the leg of a primary cyclone to form a single primary and secondary cyclone leg complex, wherein solids collected in both cyclones are combined (i.e., which reads on, "... passing the gasiform material through two or more stages of cyclone separators or other dust separating means. Each of the stages may comprise *more than*

one cyclone separator provided with diplegs which converge into a larger common dipleg for each stage," column 3, lines 11-19); said separator leg terminating distally in a radius-curved single leg termination that is immersed in a fluidized bed of particulates (i.e., dipleg **38** provided at its lower end with a U-bend or 180° bend **40** and a riser portion **42**; column 3, lines 24-44); wherein the collected and combined solids are discharged from the separator through said termination. In view of the newly added structural limitation, Kaulakis further discloses the termination is devoid of movable sealing parts (i.e., no mechanically operated sealing elements are disclosed).

Instant claim 1 structurally reads on the apparatus of Kaulakis.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Jones (US 2,634,191).

Jones (FIG. 1-3) discloses, "Solids removed from the effluent gases by the cyclones are returned through a pipe to the fluid bed. This pipe, commonly called a 'dip-leg,' *extends below the surface of the bed* in order to provide a seal against gases which might otherwise be blown upwardly in the dip-leg and prevent proper action of the cyclone. In some installation *cyclones in multiple are used discharging solids into a common dip-leg.*" (column 1, lines 32-48). Also, Jones discloses, "It is *desirable to terminate dip-leg 16 with a bend 20* to act as a baffle against bubbles of air rising through the catalyst bed," (column 4, lines 36-39), wherein bend **20** comprises a "radius-curved single leg termination." In view of the newly added structural limitations, Jones discloses leg termination **20** being devoid of movable sealing parts, such being desirable because the mechanically operated dampers of the prior art tended to jam during filling or cause an undesirable restriction to the normal flow of solids during operation (column 2, lines 9-17). In contrast, Jones (FIG. 2) discloses a single leg termination **20** being sealed by means of

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a metal plate **19** temporarily held across the outlet of dip-leg **16** by a fusible link **21** whose melting point is at, or somewhat below, the normal operating temperature. The sealing means may also comprise a seal composed either partly or wholly of a material that will fuse or otherwise rupture or disintegrate at the desired temperature (column 2, lines 24-55). "During normal operation of the unit, *dip-legs 11 and 16 are open at the lower ends* [thereby being devoid of movable sealing parts] to permit return of catalyst from the cyclones to the fluid bed. In Figure 1, dip-legs **16** of secondary cyclones **13** are shown closed by plates **19** to illustrate the situation occurring according to the invention when catalyst is being introduced into the regenerator during starting up the plant." (column 3, lines 27-51).

Instant claim 1 structurally reads on the apparatus of Jones.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (U.S. 2,634,191) in view of Danielsen et al. (U.S. 4,996,028).

Jones is silent as to the specifically recited ratio of radius-to-diameter for the single leg termination **20** (FIG. 1-3). In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a ratio of 1.0 to 3.0 for the ratio of radius-to-diameter for the single leg termination in the apparatus of Jones, since the specific ratio is not considered to confer patentability to the claim since the precise ratio would have been considered a result effective variable by one having ordinary skill in the art. Accordingly, one having ordinary skill in the art would have routinely optimized the ratio of radius-to-diameter in order to obtain a desired solids level within the cyclone diplegs, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Danielson et al. is further provided to evidence the conventionality of providing a single leg termination to the distal end of a cyclone dipleg according to the recited configuration, wherein, "... the radius of curvature of the tubular body portion **25** preferably is in the range of from *about 1 1/2 times to about 2 1/2 times* the diameter of the tubular body portion **25**." Maintaining a pre-determined, sufficient, radius of curvature increases, under conditions of use, the stability of the dipleg solids level over that of diplegs having straight run tubular body portions, as taught by Danielson. (column 3, lines 2-10; FIG. 1-2).

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (U.S. 2,634,191) in view of Luckenbach (U.S. 4,074,691).

Regarding claim 4, although Jones is silent as to bend **20** (FIG. 1-3) being constructed from a succession of straight tube sections arranged in an arcuate array, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to

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select such a construction for the bend in the apparatus of Jones, since substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). To evidence the conventionality of such construction, Luckenbach (FIG. 1) teaches a cyclone comprising a dipleg **16** having a leg termination constructed of a pair of interconnected angularly disposed conduit members **12** and **14**, the upper one of which is lineal and connected with the lower vertical portion of the cyclone dipleg **16**.

Regarding claim 5, as seen in the Figure 2 of Jones, the bend **20** of dipleg **16** inherently directs the flow of descending mass of solids into a plane orthogonal to the ascending gaseous flow, by virtue of the total angle subtended by bend **20**.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (U.S. 2,634,191).

Jones only illustrates the configuration of "cyclones in series, or series-parallel... with individual diplegs," (column 1, lines 46-48; FIG. 1). However, if accordingly modified to comprise the disclosed, "cyclones in multiple... discharging solids into a common dip-leg," (column 1, lines 32-46), the discharge end (defined by plate **19**) of the dipleg **16** would *inherently* lie on the side opposite the junction of the primary and secondary cyclone diplegs **16** and **11**, respectively. Additionally, the junction would inherently be located at a higher elevation than the distal end of the radius-curved termination. Although Jones is silent as to the vertical distance between the junction and discharge end, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate distance (such as the recited range) between the junction and the discharge end in the apparatus of Jones, on the basis

of suitability for the intended use and absent showing any unexpected results, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Response to Arguments

8. Applicant's arguments with respect to claim 1 and 3-6 have been considered but are moot in view of the new ground(s) of rejection, as necessitated by amendment.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

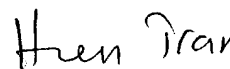
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung

June 21, 2004



HIEN TRAN
PRIMARY EXAMINER